Rec 1-30-'63

PAECO - A DIVISION OF HEWLETT-PACKARD COMPANY

TECHNICAL DATA

620 PAGE MILL ROAD/PALO ALTO, CALIFORNIA - 326-5360 (Area Code 415)

Frequency Changer Model 4301

26/163

Reid 1-30-63

FREQUENCY CHANGER MODEL 4301

Compact Design ***Adjustable Regulation***

Low Distortion ***Adjustment Accessibility***

SPECIFICATIONS

Output Power ..... 250 va

Output Voltage ..... 0-130v (2 amps maximum at 125v)
0-260v (1 amp maximum at 250v)

Output Current ..... Maximum current is proportional to output voltage (i.e. 2 amps at 125v, 1 amp at 62.5v, etc.)

Load Power Factor Range ..... 1.0 to 0.7 lead or lag

Harmonic Distortion
- Resistive Load ..... Less than 1%
- 0.7 P.F. Load ..... Less than 5%

Output Regulation vs Load ..... Better than ±1% or ±1v (whichever is greater) with front panel REGULATION control full clockwise. Can be set to give 0% for a given load condition.
Resistive Load*

Output Regulation vs Line ..... Better than ±1% for ±5% line voltage changes at 250 va or less. Better than ±1% for ±10% line voltage changes at 190 va or less.

Output Recovery Time ..... Less than 0.5 second for a no load to full load change

Internal Oscillator
- Frequency Range ..... 40 to 2000 cps
- Accuracy ..... ±1%
- Stability ..... ±1%

External Frequency Input
- Frequency Range ..... 40 to 2000 cps
- Voltage ..... Approximately 2.5v rms for maximum rated output
- Input Impedance ..... Greater than 20k ohms

Hum and Noise ..... Greater than 70 db below rated output

Input Power ..... 115v or 230v ±10%, 50 to 60 cps, 500 to 750 watts

Size ..... 12-17/32" H x 16-3/4" W x 24-3/8" D (22⅜" behind panel)

Weight ..... 124 lbs. net; 150 lbs. shipping

Price $1350.00

Terms ..... Net 30 days

* For a reactive load of 0.7 power factor the regulation is typically ±5% or ±5v (whichever is greater), depending on the exact nature of the reactive load, the total load, the setting of the REGULATION control, and the frequency of operation.

DATA SUBJECT TO CHANGE WITHOUT NOTICE

Prices f.o.b. factory

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The PAECO Model 4301 Frequency Changer is one of the most useful instruments in any electrical or electronic facility. A more descriptive title would be a "Variable Frequency AC Power Supply" since it is an RC oscillator feeding a sine wave into a low distortion power amplifier. The circuitry designed for this instrument was chosen for its stability, accuracy, and reliability. The housing is a modern cabinet that is very compact and rugged, and offers flexibility of use. Front panel accessibility for important adjustments is one feature that indicates how PAECO designed the Model 4301 for ease of operation.

APPLICATIONS

The uses for the PAECO 4301 Frequency Changer are unlimited. Some of the more common are as a stable power source for testing filters, magnetic amplifiers, servo systems, and all types of instrumentation. It will also supply power for checking out equipment designed to operate in countries where different voltages and frequencies are supplied. The Model 4301 operating over a 50 to 60 cps range at either 115 or 230 volts (±10%) input can be used to supply a critical instrument which requires one frequency with good regulation and pure waveform.

FEATURES

All important monitoring and adjusting can be accomplished from the front panel. An easy-to-read voltmeter is supplied that can be switched to cover three ranges: 0 to 65, 0 to 130 and 0 to 260 volts. This meter is accurate to 3%. The output voltage is continually adjustable over the entire range of 0 to 260 volts. This same meter can be switched to read the biasing of the two push-pull output tubes. Screwdriver adjustments on the front panel allow the operator to balance the output tubes to give minimum distortion without the hazard of going inside the cabinet while power is on. Separate circuit breakers for the high voltage and low voltage supplies are mounted on the front panel.

Another adjustment is provided to set the output impedance to zero so that for any given load the regulation will be 0% no load to full load. This is particularly useful for production testing of equipment. Once the REGULATION control is set for the full load condition, the output voltage remains constant for the loaded and unloaded testing of the equipment.

The frequency scale can be set for three ranges. The same selector switch has a fourth position for an external signal. A jack is provided for connecting the external frequency source.

The output can be changed from the 115v to the 230v range by a front panel switch. This switch has a protective cover to prevent its being thrown accidentally.

CIRCUITRY

The signal source in the PAECO Model 4301 Frequency Changer is the famous hp RC oscillator (Wein Bridge) which has been a recognized standard in the electronics industry for many years. Starting with this stable and accurate frequency source, the signal is fed into a Class AB, push-pull power amplifier using beam power tetrodes. Since all tubes change slightly over a period of time, adjustments are provided that allow the operator to balance the bias on each output tube equally to give minimum harmonic distortion in the output. The settings are monitored on the front panel meter. A high degree of negative feedback is used to provide good output waveform. The distortion is less than 1% over the full operating frequency range, and is typically less than 0.5% over most of this range.

A small amount of adjustable positive feedback allows the operator to set the Model 4301 to zero output impedance. The low voltage power supply is highly regulated to give stable operation over wide swings in the input line voltage.

Silicon diode rectifiers are used in both the high voltage and low voltage power supplies to minimize power consumption and heat build-up.

EXTERNAL SIGNAL

By a selector switch the operator can disconnect the internal frequency source, and introduce an external signal through the jack provided on the front panel. Thus, frequency accuracy and stability greater than the ±1% specified can be obtained.

HOUSING

The modern cabinet into which the PAECO 4301 is packaged was chosen for pleasing and functional styling. It can be used for bench, stacking, or portable applications, and fits into standard instrument dollies such as the hp AC-115B Testmobile. Kits are available for conversion to rack or slide mounting.